C. Local Conservation Targets and Strategies

For each GUSG population, we offer a discussion of and rationale for the conservation target. Specific recommended strategies are divided into 3 sections for each population: (1) Habitat Protection; (2) Habitat Improvement; and (3) Population Management. Many of the strategies refer the local reader/manager to broader protocols or strategies in the preceding "Rangewide Strategy" section. Note that the strategies are not presented in any order of priority; all the strategies given for each population are important. The guidance provided here may be used to update local conservation plans. The targets and recommended strategies are thought to be sufficient to conserve GUSG. However, local groups may choose to aim for additional conservation measures.

Local conservation targets were established by analyzing the modeled population capacity based on the current occupied acreage, the currently un-occupied (but apparently suitable) habitat, and the amount of habitat that could potentially be created through restoration and management of currently unsuitable, but potential habitat (Table 32). Potential, but currently unsuitable habitat was a broad category that included areas not likely to be convertible to sage-grouse habitat given any degree of economic sustainability (such as cropland in Dove Creek and Monticello, or houses in Piñon Mesa), so not all habitat in that category was considered when establishing targets. Assumptions used about habitat suitability are discussed within each population summary.

For data analysis in this section as well as in "Analysis of Population Size in Relation to the Amount of Available Habitat" (pg. 186), we refined the "Occupied Habitat" category. Local CDOW and UDWR biologists identified vegetation classes that are used by GUSG within the "Occupied Habitat" category for each population (data from the CVCP or the Utah Gap Analysis dataset). For instance, the "Occupied Habitat" boundary may have included classes not used by grouse, but found scattered within the boundary (e.g., ponderosa pine). These classes were eliminated from the analysis used to determine acreage needed to support certain numbers of grouse. Hence, the "Occupied Habitat" numbers in tables within this section are a subset of the actual occupied habitat acreage and are referenced as selected classes. The "Vacant" and "Potential" habitat categories were not refined or changed.

Table 32. Occupied, vacant, and potential habitat, modeled population capability, recent population size, and future population target, by GUSG population. See "RCP Habitat Mapping" for definitions of habitat types (pg. 54), and see "Status and Distribution of Individual Populations" (pg. 56) for maps of occupied, vacant, and potential habitat for each population.

Population	Habitat Estimates (acres)			Modeled Population Capability (males), total [1]			Recent Population [2]		
	Occupied [3]	Vacant [4]	Potential [5]	Occupied [6]	Occupied + Vacant	Occupied + Vacant + Potential	Males	Total	Future Target
Gunnison	530,464	22,879	157,240	(620) 3,039	(647) 3,174	(836) 4,099	605	2,968	3,000
Crawford	34,908	18,136	61,848	(25) 122	(47) 229	(121) 593	40	196	275
San Miguel	85,999	41,360	61,783	(86) 423	(136) 666	(210) 1,030	62	304	450
Dove Creek	26,907	52,747	237,492	(15) 75	(79) 385	(364) 1,783	30	147	200
Monticello, UT	59,576	56,824	75,285	(54) 267	(123) 602	(213) 1,045	37	182	300
Piñon Mesa	24,185	63,584	136,361	(12) 59	(88) 433	(252) 1,236	26	128	200
Poncha Pass	14,781	0	27,794	(1) 4	(1) 4	(34) 167	8	39	75
Cerro Summit - Cimarron - Sims	37,145	4,874	20,462	(28) 35	(33) 164	(58) 284	7	34	TBD

[1] Estimated from regression of occupied habitat vs. population estimate derived from high count of males.

[2] Based on multiple-year average of lek counts with comparable sampling effort; time period for each population same as habitat model (see pp. 186-187).

[3] Acreage of habitat within each population thought to be occupied by sage-grouse, as delineated by local biologists. Vegetation classes that are used by grouse were selected by local biologists within occupied range boundary.

[4] Acreage of apparently suitable habitat that is not currently known to be occupied habitat, as delineated by local biologists.

[5] Acreage of habitat that could, with intensive management, be suitable for sage-grouse, as delineated by local biologists.

[6] Population estimate converted from average of recent lek counts as: (average number of males/0.53) + [(average number of males/0.53)*(1.6)]; (see pg. 45).

Cerro Summit - Cimarron - Sims Mesa

Primary Issues to be Addressed

The areas of primary focus for this population are the need to obtain better population monitoring data, the need for development of habitat linkages between these areas and other populations, protection of habitat from permanent loss, habitat enhancement and restoration, maintenance of genetic diversity, and grazing management.

Population monitoring is critical for this small population. It is suspected that lek counts underestimate the total number of males in the population, but lack of road access, snow depth, and extensive private land make searches difficult.

A significant portion of the population area is private property in relatively small tracts and could be at risk for development. The most significant of these is the subdivided area south of Montrose Lake. However, at the Cerro Summit - Cimarron area the Cimarron SWA provides a protected core area, and some conservation easements have been negotiated (see Fig. 9, pg. 61, Appendix D, and Fig. 1 in Appendix F). At Sims Mesa much of the core GUSG use area is in private hands (Fig. 2 in Appendix F), and though there is some risk of development on private land, property prices are high. Substantial funds would be needed to protect adequate habitat for this population.

The habitat in this area is highly fragmented and restricted in size, and much of the habitat consists of even-aged stands of sagebrush, as well as areas with piñon-juniper encroachment. At Cerro Summit – Cimarron habitat fragmentation has occurred primarily through sagebrush removal and oakbrush advancement. Landowners should be encouraged to thin, rather than remove, sagebrush. Poor habitat conditions in the Sims Mesa area include lack of understory in non-treated sagebrush areas (primarily private lands), lack of understory diversity in treated areas (domination by crested wheatgrass in the plowed and seeded areas on BLM property), piñon-juniper invasion, sheet erosion, gully formation, and invasive weeds, primarily cheatgrass. Nearly all BLM-managed property on Sims Mesa was plowed and seeded with crested wheatgrass for grazing in the 1980's. Though the sagebrush has slowly returned, the understory remains almost entirely crested wheatgrass.

The limited available habitat suggests that local extinctions may occur without intervention. The current habitat needs to be managed and protected to make the risk of extinction as low as possible. Periodic demographic rescue may be necessary, and infusions of genetic material to counter loss of genetic diversity will probably be necessary.

Livestock grazing needs to be better managed through adjustments in stocking levels and timing to allow for enhancing, restoring, and/or maintaining sage-grouse habitat to meet recommended guidelines. Pasture fencing on some lands may be an effective means of improving grazing management to allow for sage-grouse habitat improvement.

Strategies to assist with these and other issues are provided in this section.

Population Target

We lack sufficient information on population size, historical trends, and habitat suitability to effectively plan conservation efforts for this population. Since 1999, counts of males on 4 known leks (2 currently used) have ranged from 5 to 12. Genetic information suggests this population is not functionally connected to the Gunnison Basin or to Crawford,

but may have received migrants from the San Miguel Basin. It appears unlikely that habitats in these areas are capable of supporting more than about 100 grouse (Table 32, pg. 256), and that may require extensive habitat improvement. Even at that, the 50-year extinction probability would be about 35%. Under current habitat conditions and population sizes, extinction is highly likely without intervention. This population also has relatively low potential for serving as a reservoir for demographic or genetic rescue of other populations. The main conservation value of this area may be to serve as a potential linkage area for genetic dispersal. As such, habitat protection efforts and priorities related to linking populations, rather than population goals, are suggested for this area until and unless further research indicates substantially larger population size or potential.

Table 33. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (for definitions, see pg. 54) in the Cerro Summit – Cimarron – Sims Mesa population area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	**Category**					
	Currently Occupied		**Vacant/Unknown use**		**Potentially Suitable**	
	Acres *	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	18,926	51	1,725	35	8,834	43
Grass/forb rangeland	3,893	11	442	9	1,973	10
Gambel Oak	2,766	7	70	1	1,578	8
Mountain shrub	2,639	7	415	9	460	2
Piñon-Juniper dominant	3,863	10	1,172	24	3,193	16
Coniferous/deciduous trees	681	2	689	14	628	3
Agriculture	2,972	8	-	-	3,438	17
Other	1,405	4	351	7	358	2
Total	**37,145**	**100**	**4,864**	**100**	**20,462**	**100**

*Note: In this population area, acreage includes all vegetation types within the delineated boundary of the Occupied Habitat. Not enough information is known about which vegetation classes are selected by sage-grouse in this area to select utilized vegetation classes.

Formation of a local work group and development of a local conservation plan is encouraged. Further research is clearly warranted. The habitat protection goal enumerated should be sufficient to maintain dispersal through this area, and to maintain grouse if a significant population is detected.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: If research indicates this area functions as an effective linkage for gene flow among populations, maintain 75% of occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F).		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss**.**	BLM, CDOW, County Governments, NGO's	Ongoing and by 2020
2. Establish Local Work Group for this population and develop work group plan.	BLM, CDOW, County Governments, NGO's, NPS, NRCS, Private Landowners	2008

HABITAT IMPROVEMENT

Strategy 1: Improve existing habitat on Sims Mesa to meet habitat quality guidelines (Appendix H).		
Task(s)	**Responsible Group(s)**	**When**
1. Improve, where deficient, understory grass and forb components within nesting and early brood-rearing areas associated with the Sims Mesa lek (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM	2020

Strategy 2: Develop additional GUSG habitat in un- or under-utilized Occupied Habitat as well as in Potential Habitat areas.		
Task(s)	**Responsible Group(s)**	**When**
1. Remove piñon-juniper that is invading sagebrush parks within currently occupied or potential habitat on Sims Mesa (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM	2020

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, County Governments, NPS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, Local Work Group, NPS	ASAP
3. Implement recommendations from rangewide strategy on "Oil & Gas Development and Mining" (pg. 233).	BLM, Oil and Gas Companies, Private Landowners	As needed

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220).	BLM, CDOW, Local Work Group	As needed
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group	As needed
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, Local Work Group, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241), if and when population size is determined to be large enough to warrant.	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208), if and when population size is determined to be large enough to warrant.	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220)	BLM, CDOW, NPS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220)	BLM, CDOW, NPS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS	July, 2006

Crawford

Primary Issues to be Addressed

The issues of primary focus for this population are habitat enhancement and restoration, expansion of occupied habitat, and protection of habitat from permanent loss, especially in potential areas of expansion.

The apparent recent decline in the Crawford population (Table 10, pg. 64) may be due in part to drought conditions that reduced forbs, insect production, and wet meadow areas, all of which are important elements of brood habitat. In addition, past management activities, including fire suppression and selective livestock grazing, have resulted in piñon-juniper encroachment as well as late-seral shrub growth, specifically serviceberry and oakbrush. Several known historic lek sites are believed to be inactive because of piñon-juniper invasion or overgrowth of sagebrush and grass in what were once more open areas. The local work group has used funding from the BLM, CDOW, and the North Fork Habitat Partnership Program to increase available habitat by reducing acreage of piñon/juniper through controlled burns (2,845 acres), cutting (700 acres), or roller chopping (1,050 acres) trees. Analysis of GIS vegetation data indicates another 13,000 acres of sagebrush habitat could be added through piñon/juniper removal.

The local work group has accomplished other significant habitat improvement. Brood-rearing habitat, particularly late brood-rearing habitat along wet meadows or riparian habitat appears limiting. Efforts to cut, brushbeat, or otherwise control juniper, oakbrush, or other tall shrubs near lek sites that could conceal predators should continue. Steve Monsen, a noted shrubland restoration expert (USFS, retired) has commented that of the GUSG population areas he has visited, the Crawford Area is the most productive and favorable for accomplishing sagebrush restoration (S. Monsen, personal communication).

Expansion of the area occupied by sage-grouse is necessary in this population in order to meet population goals (see below). Piñon-juniper and late-seral shrub expansion have contracted the range of sage-grouse at Crawford. Currently identified Potentially Suitable Habitat (see Fig. 11, pg. 67) could support additional sage-grouse with the application of habitat restoration measures such as piñon -juniper and oakbrush removal and/or thinning.

Overall, threats due to habitat conversion or development within currently occupied range have been largely mitigated in Crawford. The majority of occupied sagebrush habitat is publicly owned (76%). Another 9% of occupied habitat is privately owned but protected by easement, bringing the total protected acreage to 85%, near the 90% habitat protection goal. The NPS has a conservation easement on about 2,000 acres, while the CDOW has secured an easement on a 560-acre parcel, and is working with the same landowner on an additional easement on a nearby parcel of 300 acres. An elk ranch that occupies the eastern edge of the main grouse habitat area auctioned off several hundred acres of land in the summer of 2004 in 40-acre plots for cabin/home sites. Fortunately, 7 of these lots were purchased by a landowner who is interested in working with the CDOW on protecting them with easements. Protection of many of the 45 lots in the east-central portion of the occupied area should be a priority. Potential habitat that birds may expand to with habitat improvement is a mix of public and private, and additional habitat protection strategies may be necessary if and when birds utilize these areas.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

We have set a goal of a long-term average breeding population of 275 birds at Crawford (Table 32, pg. 256). At stable growth rates, this population size has a 50-yearextinction probability of approximately 9%, without intervention. A population that averages 275 birds (over approximately 10 years) would be expected to fluctuate between 159 and 484. Currently, based on extrapolations from male counts, there may be about 125 birds in Crawford, but populations in the late 1990s may have been as high as 175 to 200 birds. We estimate about 35,000 acres of habitat is currently occupied (Table 34). Based on our habitat model (see GUSG linear model, discussion begins pg. 186), that amount of habitat, if of average quality, should support an average of about 122 sage-grouse.

We estimate there is an additional 18,000 acres that is suitable but unused, which increases the modeled capacity to 229 sage-grouse (Table 34). Even at that, it is apparent additional habitat must be added and/or habitat quality must be enhanced if we are to meet our population target. We have identified a potential, but currently unoccupied area of 61,848 acres. About 41% of this area is currently dominated by sagebrush communities (Table 34). Removing piñon-juniper and Gambel's oak stands could make much of this area usable by grouse.

Table 34. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in the Crawford population area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied – Selected Classes		**Vacant/Unknown use**		**Potentially Suitable**	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	27,759	80	5,585	31	25,481	41
Saltbush	182	<1	5,647	31	328	1
Irrigated Agriculture	-		4,599	25	-	-
Agriculture	465	1	458	3	13,069	21
Piñon-Juniper dominant	3,213	9	476	3	6,826	11
Gambel oak dominant	953	3	-	-	6,738	11
Other	2,336	7	1,371	7	9,406	15
Totals	**34,908**	**100**	**18,136**	**100**	**61,848**	**100**

The CACP (1998) stated a population goal of a minimum of 225 individuals in the spring, with the objective of increasing that to 480 individuals by 2010. Neither of those goals is likely to be attainable. A minimum population of 225 would correspond to an average population of about 375 birds. Our regression analysis suggests maintaining an average population size of 375 birds would require over 76,000 acres of habitat, and 480

birds would require about 94,000 acres of habitat, both significantly above what is currently occupied (~35,000 acres), or what could probably be added through intensive management.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), as well as additional habitat in areas of expansion (if and when GUSG use them), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F).		
Task(s)	**Responsible Group(s)**	**When**
1. Use all available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect GUSG habitat on private land.	CDOW, County Governments, NGO's	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 3,500 acres of additional GUSG habitat in un- or under-utilized Occupied Habitat as well as in Potential Habitat areas.		
Task(s)	**Responsible Group(s)**	**When**
1. Remove encroaching piñon/juniper from 3,500 acres within currently occupied or potential habitat (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NPS, NRCS	2015
2. Develop an additional 5–10 wet-meadow habitat areas for potential brood-rearing sites and conduct annual maintenance on existing structures (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NRCS	2010

Strategy 2: Complete an assessment of breeding/early brood-rearing habitat quality based on "GUSG Structural Habitat Guidelines" (Appendix H); develop and implement a plan to improve areas that are deficient.		
Task(s)	**Responsible Group(s)**	**When**
1. Complete habitat quality assessment to determine areas not meeting structural guidelines; develop plan to improve areas that are deficient (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2006
2. Brush beat or otherwise control sagebrush and other shrubs on lek sites (Monsen 2005). (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed
3. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2006 and ongoing

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Incorporate recommendations from rangewide strategy on "Grazing" (pg. 211) into grazing management plans on 25,000 acres.	BLM, CDOW, NRCS	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, County Governments, NPS, Utility Companies	ASAP
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, Local Work Groups, NPS	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220).	BLM, CDOW, Local Work Group, NPS	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, NPS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group	2005
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, CDOW, Local Work Group, NPS, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level ("Habitat Monitoring", pg. 220)	BLM, CDOW, NPS, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level ("Habitat Monitoring", pg. 220)	BLM, CDOW, NPS, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS, USFS	July, 2006

Gunnison Basin

Primary Issues to be Addressed

Primary issues for the Gunnison Basin population include protection of habitat from permanent loss, grazing management, habitat enhancement and restoration, the need for management of lek viewing, and the importance of the population for research and augmentation efforts.

The main threat to GUSG in the Gunnison Basin is loss and fragmentation of habitat, especially due to residential development (risk of development is discussed in detail in "Habitat – Risk of Permanent Loss", pg. 149). Although a majority (69%) of occupied habitat within the Gunnison Basin is under public ownership and protected from conversion, about a third of lek sites (37%), production areas (34%), and winter range (32%) are privately owned. GUSG in the Ohio Creek drainage are particularly vulnerable because much of the land, including lek sites, is privately owned and in danger of development.

Livestock management in the Basin continues to need to be administered to maintain high quality grouse habitat while optimizing livestock utilization through stocking levels, timing of stocking, and livestock use of riparian areas. Grazing allotments up for permit renewal need to have conservation objectives incorporated into the grazing management.

Exotic plant invasions (e.g., cheatgrass) in some areas may lead to deterioration or loss of habitat, and a lack of adequate forb and or grasses in sagebrush understory also reduces habitat quality in some areas. Mapping and condition assessment of sage-grouse habitats in the Gunnison Basin need to be continued, so that habitat below recommended guidelines can be identified and improved. Data on nest success and chick survival (indexed by chicks per hen in the harvest) suggested that habitat quality was about average in the Gunnison Basin, although there appears to be a recent declining trend in productivity (see "Gunnison Basin Population", pg. 73). Habitat treatments designed to increase vegetation cover, particularly understory vegetation, at nest sites could presumably increase nest success. The relative gain may not be great, given site potential and reasonably good nest success already. Targeting brood-rearing habitat might be a more effective approach. Habitat improvement aimed at increasing the forb component of deficient early brood-rearing habitat or wet meadow/riparian habitats for late brood-rearing may be very beneficial.

The public has demonstrated interest in viewing GUSG in the Gunnison Basin, particularly strutting males at leks. Providing managed lek viewing opportunities limited to a single area allows for this activity while reducing potential impacts to many leks. Management of the site is needed to provide guidance for human activities and development of facilities to minimize potential impacts to the grouse, as well as to provide informational and educational opportunities to the public.

As the core population of GUSG, the Gunnison Basin population will continue to be invaluable for conducting needed research, as well as contributing birds to augment other populations and genetic diversity in other populations, when necessary.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

The population target for the Gunnison Basin is set at a long-term (10-year) average of 3,000 breeding birds (Table 32, pg. 256). The average population estimate from 1995-2004 was less than 3,000 birds, based on an extrapolation of lek counts. Because of the importance of this population to the overall conservation of the species, it is essential to obtain accurate estimates of the true size of this population. The challenge will be to protect and enhance enough of the important seasonal habitats to direct and mitigate effects of development that will continue to occur so that the population remains at this level over the long term. Although a great deal of work has already been done toward the protection and improvement of GUSG habitat in the Gunnison Basin, development and other conversions of sagebrush habitats continue in the Basin. Habitat protection through easements, fee-title acquisition, land-use restrictions, or by other means is the highest conservation priority for this population.

In our PVA analysis, an initial population size of 3,000 had extinction probabilities of less than 1% at all growth rates used in the model, and a nearly zero probability of extinction at stable growth rates. In the *VORTEX* simulations, this population size also retained from 90-93% (depending on assumptions of the percent of males which breed) of genetic diversity over 50 years. A population with a long-term average of 3,000 breeding birds could expect normal fluctuations between 1,730 and 5,280 breeding birds, based on analysis of long-term trends in high counts of males on leks in North Park (see "Analysis: GUSG Population Size in Relation to the Amount of Available Habitat", pg. 186).

Based on analysis of data collected during the Basinwide vegetation classification project (Colorado Division of Wildlife 2004b), we estimate sage-grouse occupy about 530,500 acres of sage-grouse habitat in the Gunnison Basin (Table 35). Our analysis of long-term average population sizes at varying habitat acreages suggests the occupied acreage, if of "average quality" would support about 3,039 birds (see Table 32, pg. 256). Including the 23,000 acres of apparently suitable, but currently unoccupied habitat suggests the GUSG population could be about 3,174 birds. About 56% of this vacant habitat is dominated by coniferous vegetation (suggesting use may be seasonal) or located northeast of the current population near Taylor Reservoir (which would require transplanting GUSG that could potentially create a new isolated population). Therefore, we consider vacant habitat will not provide many opportunities for expanding the current GUSG range. Another 157,000 acres of potential habitat was delineated which, if improved, could support grouse. Just under half (46%) of this category was in sagebrush communities, while 31% was classified as some type of forested habitat. If about half of this potential habitat category could be improved to support grouse (78,620 acres), this habitat could add almost an additional 400 grouse. However, complex landownership patterns may limit the opportunities for expanding the current GUSG population into areas with unsuitable habitat (Fig. 14, pg. 74). The greatest potential is perhaps in the Curecanti region of the Basin (Fig. 5, pg. 50). Furthermore, qualitative assessments of sagebrush habitat in some of the potential sites suggest restoration will require a long-term habitat management plan that will not likely produce immediate increases in the GUSG population.

Table 35. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in the Gunnison Basin. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

Vegetation Classification	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
	Acres	Percent	Acres	Percent	Acres	Percent
Sagebrush dominant	407,045	77	7,990	35	72,308	46
Coniferous/deciduous trees	27,917	5	12,779	56	52,398	33
Willow	2871	<1	1,325	6	1,655	1
Grass/forb rangeland	42,763	8	-	-	14,404	9
Other	49,867	9	785	3	16,475	11
Total	**530,464**	**100**	**22,879**	**100**	**157,240**	**100**

The GBCP (1997) described a minimum spring breeding population of 2,600 sage-grouse on 25 leks, and an optimum spring population goal of 3,600 on 30 leks. If the 2,600 birds was a true minimum (i.e., the lowest the population would get), then that population would be expected to average about 4,300 birds, well above the optimum population goal. It is more likely the stated 2,600 bird target would represent an average population size, in which case the population would fluctuate between about 1,560 and 4,575.

Several entities, including the CDOW, hold conservation easements on 23,836 acres of private land within occupied range. The top conservation priority for this population should be to protect seasonally important habitats on private land that are at significant risk of conversion. About 6,500 acres of privately owned severe winter range, nesting and brood-rearing areas are projected to increase to unsuitable housing densities by 2020. There is significant overlap between seasonal habitats at risk of development; protection of many individual properties will protect multiple seasonal habitats.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of seasonally important habitats (combined public and private, as mapped), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154, and Appendix F).		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats from permanent loss.	BLM, CDOW, County Governments, NPS, USFS	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Identify areas where GUSG habitat is significantly below guidelines.		
Task(s)	**Responsible Group(s)**	**When**
1. Use demographic data, habitat use data, vegetation data, and Basin-wide data to identify and map areas where habitat quality is below recommended levels and may be limiting sage-grouse productivity.	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2006

Strategy 2: Improve 15,000 acres of existing seasonal habitats to meet habitat quality guidelines (Appendix H).		
Task(s)	**Responsible Group(s)**	**When**
1. Improve summer - fall habitat where forb component is significantly below guidelines through fencing, spring development, or other means (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2010
2. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NPS, NRCS, USFS	2015
3. Complete habitat improvement options on approximately 1,000 acres as specified in NFWF and Wetlands Initiative Grant in Long Gulch. Improve breeding habitat in Long Gulch through treatments that may include, but are not limited to: enhancing water sources, fencing, vegetation treatments, prescribed fire, interseeding, brush beating (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW	2007
4. Incorporate sage-grouse habitat recommendations into existing conservation easements that don't contain them, where possible.	CDOW, NGO's	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Establish GUSG local conservation plan objectives on grazing allotments up for permit renewal. This is an ongoing project in the Gunnison Basin. Currently, 113,000 acres of allotments without local conservation objectives are up for renewal.	BLM, Local Work Group, Private Landowners, NRCS, USFS	2009

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225).	BLM, CDOW, County Governments, NPS, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, Local Work Group, NPS, STL, USFS	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220).	BLM, CDOW, Local Work Group, NPS, NCRS, USFS	Ongoing
2. Monitor recovery of sagebrush stands that recently died or experienced defoliation due to drought and associated stresses, and implement restoration treatments if necessary.	BLM, CDOW, NRCS, USFS	As needed
3. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, NPS, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group, NPS	2005 and ongoing
2. Implement recommendations from rangewide strategy on "Recreational Activity" (pg. 245).	BLM, Local Work Group, NPS, USFS	As needed
3. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, CDOW, Local Work Group, NPS, STL, Utility Companies	As needed

Strategy 3: Contribute birds to augment population and genetic diversity of other populations.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW, Local Work Group	ASAP and ongoing
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220).	BLM, CDOW, NPS, USFS	Begin in 2006; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level ("Habitat Monitoring", pg. 220).	BLM, CDOW, NPS, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, NPS, USFS	July, 2006

Monticello, Utah and Dove Creek, Colorado

Primary Issues to be Addressed

Primary issues for this population include habitat loss to subdivision and issues surrounding CRP renewal, poor habitat quality and quantity, increased oil and gas development (in Utah), low existing genetic diversity, and lack of linkages between Monticello and Dove Creek as well as between sub-groups of birds within the Dove Creek area.

The threat to GUSG in the Dove Creek area from subdivision development is discussed in detail in "Habitat – Risk of Permanent Loss", pg. 149. Almost all occupied habitats in both states are in private ownership. Population growth in this area does not present a great risk, but tract sizes are relatively small and important habitats are at some risk. Much of the core habitat available and used by birds north of Dove Creek occurs within the 2,700-acre Secret Canyon Ranches subdivision. Full build-out of this subdivision, plotted largely to 35- and 40-acre lots, would probably extirpate the Colorado subpopulation. One individual has bought up many of the more critical lots and has attempted for several years to interest the BLM in a trade of some sort. It is essential that the 733 acres he now owns, which connect existing BLM and CDOW parcels, come into public ownership or protection in some way. About 800 acres in the Dove Creek area have been enrolled in 20-year term easements. UDWR and BLM have obtained about 2,700 acres in perpetual easements in the Monticello area.

The CRP represents another short-term (10-15 year) habitat protection program. In Utah, almost 37,000 acres of privately owned cropland within the CCA have been enrolled in CRP, while Dolores County, Colorado, also has about 37,000 acres of CRP. Forty thousand acres of CRP are up for renewal under the Farm Bill in the next 2 to 3 years. CRP has protected this area from agricultural use and development. If this program is not continued, most of these lands will most likely be put back into agricultural production, primarily with winter wheat crops, or used as pastures for cattle grazing. It is critical to this GUSG population that those parcels are renewed.

CRP has provided a considerable amount of brood-rearing habitat because of its forb component. Grazing of CRP in Utah occurred in 2003 under emergency Farm Bill provisions, due to drought. A new Farm Bill program which allows grazing of CRP is available to eligible landowners. Grazing of CRP would significantly reduce cover for sage-grouse broods.

The CRP has not greatly increased the amount of sagebrush cover. Significant use of CRP as nesting or winter habitat will require establishment of sagebrush stands in these fields, and this should be a conservation priority. UDWR has had some success establishing sagebrush seedlings in CRP, but has had little success so far planting sagebrush seed. On CRP fields where sagebrush plantings have occurred, grazing could be used as a tool to reduce competition from established grasses.

Habitat quality and quantity within this area are characterized by low elevation sagebrush stands that have low understory cover, lack diversity, and are dominated by aggressive non-native species. In Monticello, most nesting areas are in poor condition due to lack of herbaceous cover as a result of drought and grazing management practices. Long-term drought has also reduced the availability of wet meadow habitat for brood-rearing. CRP

fields are used heavily by grouse as brood-rearing areas but vary greatly in plant diversity and forb abundance, and generally lack any shrub cover. Sagebrush patches have progressively become smaller and highly fragmented limiting the amount of available winter habitat for this subpopulation. Sage-grouse sub-populations in both states show very restricted movements both daily, seasonally, and from leks to nest and brood-rearing sites (Apa 2004; Swenson 2003). They also had relatively low survival and low nest success, all indicative of poor habitat. Sage-grouse in smaller populations with more fragmented and poorer quality habitat had higher mortality rates than did sage-grouse in larger and more contiguous habitats (Apa 2004).

Additional risks to GUSG habitat exist from oil, gas, and wind power development. In the Monticello area, oil and gas leases have been acquired or applied for on state and federal mineral rights on over 5,000 acres of private property in current occupied grouse habitat. One drill has been constructed and additional drilling could be expected to occur in the next few years. There is also current interest and speculation in wind energy development on GUSG habitat in the Monticello area. A wind test tower (anemometer) has been erected at a site approximately 1.5 miles from a lek site. Landowners in the area have been contacted by power company contractors about leases for wind power development.

From a conservation standpoint, several key points stand out. Because of poor recruitment and somewhat elevated adult mortality (both likely aggravated by drought), counts of males on the Colorado side have declined to 8 in 2003 and 2 in 2004. Oyler-McCance (1999) reported low genetic diversity in this population even when populations were substantially larger, and suggested translocations to augment genetic diversity. Colorado population centers appear to be isolated to the point where they communicate sparingly, and while apparently still genetically linked to Utah birds, they do not appear well linked demographically to Utah birds. Converting cropland back to functional sagebrush communities will be difficult, and while feasible on a small scale, may not be feasible on a large scale except for what can be accomplished through set-aside programs under the Federal Farm Bill; CRP, CREP, and Grassland Reserve. Currently, county-level acreage caps, allowance of seed mixes without sagebrush seed, and emergency (or managed) haying and grazing in these programs restrict their ability to help conserve sage-grouse.

Strategies to assist the local work groups with these issues, as well as other, are provided in this section.

Population Target

These populations appear genetically linked, or at least they were in the recent past. It is assumed that they either are, or could be, demographically linked through dispersal, so population targets will be combined to determine extinction probabilities. Because this population straddles 2 states and 2 local work groups, a suggested allocation of this joint target to each state and local work group is proposed. Declines in numbers of males counted on leks have been dramatic in Dove Creek in recent years, probably due to drought impacting recruitment. We may be undercounting males slightly due to our difficulty in locating leks, which seem to be moving around as grass cover increases in CRP fields. Given current population levels at Dove Creek, translocations for demographic rescue and to increase genetic diversity will be required when drought-induced habitat deficiencies subside. Re-establishing habitat linkages between Colorado and Utah population centers will be critical to

long-term persistence. Otherwise, these population centers will function as 3 small populations with high extinction probabilities.

A combined population goal (average) of 500 is probably attainable, with habitat protection and improvement (see Table 32, pg. 256). At stable growth rates, this population size has a 50-year extinction probability of about 5%, without intervention. A population that averages 500 birds (over 10 years) would be expected to fluctuate between 288 and 880. The current population is well below the lower limit of this range now. Utah, based on a high count of 30 males in 2003, estimates a spring population of 100-120. Dove Creek had over 50 males in 1999, suggesting a population of about 150 birds, but has since declined to 8 males in 2003 and 2 males in 2004.

UDWR estimates that sage-grouse currently occupy about 60,000 acres of sagebrush and cropland, while CDOW estimates about 27,000 acres of sagebrush habitats currently exist in Dove Creek (Tables 39 and 40). Based on recent trends in lek counts and the amount of habitat currently used and potentially available (Tables 36 and 37), an allocation of the 500-bird target of 300 to Utah, and 200 to Colorado, seems defensible. This population is threatened by continued conversion of sagebrush habitats to agriculture, or to subdivisions on the Colorado side. To ensure the long-term persistence and achievement of the 500-bird population objective, large amounts of habitat (~100,000 acres) must be protected and enhanced. Based on our model, approximately 13,000 acres of additional habitat is required to obtain this goal (see GUSG linear model, discussion begins pg. 186).

Population targets in the respective local conservation plans were 500 breeding individuals by 2015 in the Monticello subpopulation and a minimum of 200 and an optimum of 480 breeding individuals in Dove Creek. It is highly unlikely that any of these population objectives are feasible as long-term averages, given any degree of economic sustainability.

Table 36. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in Monticello area. Classification is based on GIS data (Edwards et al. 1995).

	Category					
	Currently Occupied – Selected Classes		**Vacant/Unknown use**		**Potentially Suitable**	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	30,774	52	35,416	62	14,459	19
Grassland/dry meadow	2,805	5	5,797	10	1,797	3
Gambel Oak	2,889	5	2,560	5	2,340	3
Mountain shrub	157	~0	181	<1	62	~0
Piñon-Juniper dominant	-	-	7,740	14	10,718	14
Agriculture	22,951	38	2,550	4	44,610	59
Other	-	-	2,580	5	1,298	2
Totals	**59,576**	**100**	**56,824**	**100**	**75,284**	**100**

Table 37. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in Dove Creek. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied – Selected Classes		Vacant/Unknown use		Potentially Suitable	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	6,211	23	7,552	14	29,745	13
Grass/forb rangeland	3,567	13	10,766	20	28,590	12
Gambel Oak	1,165	4	6,380	12	4,339	2
Mountain shrub	1,307	5	6,160	12	3,954	2
Piñon-Juniper dominant	3,749	14	16,859	32	17,121	7
Rabbitbrush/grass mix	3,953	15	108	_	24,444	10
Agriculture	6,798	25	3	_	109,071	46
Other	157	<1	4,919	9	20,228	9
Totals	**26,907**	**100**	**52,747**	**100**	**237,492**	**100**

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F). In addition, retain protection through CRP re-enrollment of 25,000 acres in Monticello, Utah, and 15,000 acres in Dove Creek, Colorado.		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats from permanent loss in Monticello, Utah area.	BLM, County Governments, NGO's, UDWR	Ongoing and by 2020
2. Develop prioritization criteria for and strongly recommend the re-enrollment of 25,000 acres of CRP in occupied and potential sage-grouse habitat in Monticello, Utah, and 15,000 acres of CRP in Dove Creek, Colorado.	CDOW, UDWR, NRCS	By 2007

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitat (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F). In addition, retain protection through CRP re-enrollment of 25,000 acres in Monticello, Utah, and 15,000 acres in Dove Creek, Colorado.		
Task(s)	**Responsible Group(s)**	**When**
3. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect important seasonal sage-grouse habitats at significant risk of permanent loss in Dove Creek. Develop, cooperatively with the BLM and Secret Canyon Homeowners Association, a strategy for development that protects important sage-grouse areas.	BLM, CDOW, County Governments, NGO's, Secret Canyon Homeowners Association	By 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 4,200 acres of additional GUSG habitat in Dove Creek and 5,800 acres in Monticello, and create a habitat linkage between the 2 subpopulations.		
Task(s)	**Responsible Group(s)**	**When**
1. Eliminate piñon/juniper from and develop sage-grouse habitat on 800 acres between Hickman Flat and the Utah-Colorado state line, or at the periphery of occupied habitat (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, Local Work Group, NRCS, UDWR	2010
2. Eliminate piñon/juniper from 1,200 acres between currently occupied habitat north of Dove Creek and vacant/unknown habitat encompassing the Spud Patch area (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, Local Work Group, NRCS, UDWR	2010
3. Use habitat improvement techniques identified in (Monsen 2005) to establish sagebrush in 5,000 acres of CRP, other idled cropland, or other areas within 3 miles of lek sites within Utah.	BLM, Local Work Group, NRCS, UDWR	2010
4. Use habitat improvement techniques identified in (Monsen 2005) to establish sagebrush in 3,000 acres of CRP, other idled cropland, or other areas within 4 miles of lek sites within Colorado.	CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve existing breeding habitat to meet habitat quality guidelines (Appendix H) on 500 acres in Dove Creek and 500 acres in Monticello.		
Task(s)	**Responsible Group(s)**	**When**
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Groups, NRCS, UDWR	As needed
2. Improve understory grass and forb component within nesting and early brood-rearing areas where necessary to meet habitat guidelines on west side of Dove Creek subpopulation and in Utah subpopulation area (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, NRCS, UDWR	2010
3. Protect brood-rearing habitat in CRP by restricting haying and grazing, or providing incentives not to hay and graze.	CDOW, NRCS, Private Landowners, UDWR	2005

Strategy 3: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Oil & Gas Development and Mining" (pg. 233).	BLM, Local Work Groups, NRCS, STL, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, Local Work Group, STL, UDWR, Utility Companies	As needed
3. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, UDWR	As needed
4. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, Local Work Groups, UDWR	As needed

Strategy 4: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220).	CDOW, Local Work Groups, UDWR	Ongoing

Strategy 4: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, UDWR	2005-06
3. Investigate opportunities to expand currently occupied habitat into Vacant/Unknown or Potentially Suitable habitats that would also begin to establish linkages between sub-populations.	BLM, CDOW, Local Work Group	2008
4. Monitor recovery of sagebrush stands that recently died or experienced defoliation due to drought and associated stresses, and implement restoration treatments if necessary.	BLM, CDOW, Local Work Group, UDWR	As needed

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution, and to evaluate potential areas for expansion.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW, Local Work Groups, UDWR	Annually
2. Evaluate vacant habitat at La Sal, Lisbon Valley, and Hatch Point (Utah), and Spud Patch (Colorado) to determine habitat suitability and potential for re-introduction.	BLM, CDOW, Local Work Group, UDWR	2005-06
3. Evaluate the Near Draw/Far Draw area of "the Glade" to determine habitat suitability and potential for reintroduction.	BLM, CDOW	2005-06

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group, UDWR	As needed
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, NRCS, Local Work Groups, STL, Utility Companies, Oil and Gas Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241). Conduct transplant of 40 or more birds over several years to recover population and increase genetic diversity in Dove Creek.	CDOW, Local Work Group, UDWR	ASAP
2. If vacant habitat at La Sal, Lisbon Valley, and Hatch Point (Utah), and Spud Patch (Colorado) is determined to be suitable, reintroduce birds following recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW, UDWR	2007 or later
3. If the Near Draw/Far Draw area of "the Glade" is determined to be suitable, reintroduce birds following recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW	2007 or later

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Groups, Private Landowners, UDWR, USDA (APHIS)	As needed
2. Given nest success is below the 25% trigger indicated in the predator management strategy, determine specific predators reducing nest success and evaluate effectiveness of control methods on these predators.	CDOW, Local Work Group, UDWR	2005-06

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220)	BLM, CDOW, UDWR, USFS	Begin in 2006; Complete in 2008

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220).	BLM, CDOW, UDWR	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, UDWR	July, 2006

Piñon Mesa

Primary Issues to Be Addressed

Primary threats to this population are habitat loss from development and subdivision, declines in habitat quality, genetic isolation and associated lack of genetic diversity, and the need to increase acreages of occupied habitat by establishing connectivity with other suitable or potentially suitable habitats, and with other populations.

A serious long-term threat for the entire area is the subdivision of private lands into increasingly smaller parcels for development (risk of development is discussed in detail in "Habitat – Risk of Permanent Loss", pg. 149). The proximity of the Glade Park area to Grand Junction has made it an attractive area for development. This development has resulted in fragmentation and loss of sage-grouse habitat. The eastern 1/3rd of the occupied range is essentially all privately owned. The southern portion of this area contains about 2,000 acres in tracts less than 160 acres, and an additional 3,600 acres in tracts between 160 and 320 acres that could be subdivided.

Habitat quality concerns include the invasion of piñon and juniper into sagebrush areas, inadequate grass and forbs in sagebrush understory, poor vegetation conditions on leks, and a short supply of wet areas, meadows, and water sites. In addition, invasive species such as cheatgrass have increased in some areas and are out-competing native grasses and shrubs.

This population has very low genetic diversity, indicative of its isolation from other populations. Historically, connectivity to other populations probably occurred along the Uncompahgre Plateau south and west towards the San Miguel Basin, and possibly to the east towards Crawford.

The expansion of sage-grouse in this population is limited by currently available suitable habitat. A large area of potentially suitable habitat exists adjacent to currently occupied habitat (see Fig. 17, pg. 90) and offers options for acreage and population expansion.

Strategies to assist the Local Work Group with these issues, as well as others, are provided in this section.

Population Target

Although the local conservation plan for this population calls for a minimum spring count of 120 males (thought to correspond to 480 breeding birds by 2010), because of restricted habitat this goal is highly unlikely. Our habitat model suggests 480 birds would need about 94,000 acres, or almost 4 times what is currently thought to be occupied (see GUSG linear model, discussion begins pg. 186). Counts in the last 6 years have fluctuated between 23 and 33 males. We currently estimate that sage-grouse occupy about 24,000 acres, with another 63,000 acres adjacent to the occupied area that was historically occupied (Table 38). With continued habitat protection, restoration, and expansion through piñon-juniper removal, it is possible that a long-term (10 year) average population of 200 breeding birds, ranging between 115 and 352, could be maintained. At stable growth rates, this population size has an extinction probability of about 15%.

Transplants to augment the population's low genetic diversity are needed as a short-term fix, while potential connectivity through habitat treatments and transplants along the Uncompahgre Plateau should be investigated. Sage-grouse occupied the Dominguez Creek area of the northern Uncompahgre Plateau as recently as the 1980's. Potentially suitable habitat exists to the north of Piñon Mesa and also to the east on Clark's Bench and Snyder Flats (see Fig. 17, pg. 90). Habitat improvement in these areas could provide additional occupied acreage for this population.

Seventy percent of occupied habitat, and 75% of potentially suitable habitat is privately owned. Protecting seasonally important habitats from development will be critical. About a quarter (7,314 acres) of the currently occupied habitat has already been protected by conservation easements.

Table 38. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in Piñon Mesa area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied – Selected Classes		**Vacant/Unknown use**		**Potentially Suitable**	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	18,799	78	21,354	34	45,343	33
Grass/forb rangeland	1,214	5	2,104	3	4,321	3
Gambel Oak	-	-	13,084	21	10,467	8
Mountain shrub	2,295	9	5,671	9	5,620	4
Piñon -Juniper dominant	1,640	7	11,930	19	57,368	42
Coniferous/deciduous trees	-		6,784	11	4,595	3
Other	237	1	2,657	4	8,647	6
Totals	**24,185**	**100**	**63,584**	**100**	**136,361**	**100**

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154, and Appendix F).		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss on Piñon Mesa**.**	BLM, CDOW, County Governments, Local Work Group, NGO's	Ongoing and by 2015

Strategy 2: Maintain 90% of occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F) on Glade Park and other currently unoccupied areas, if and when they become occupied.		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect important sage-grouse habitats at significant risk of permanent loss on Glade Park.	BLM, CDOW, County Governments, NGO's	By 2015

HABITAT IMPROVEMENT

Strategy 1: Develop 5,000 acres of additional GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Eliminate piñon/juniper from 5,000 acres on Piñon Mesa (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve 2,000 acres of existing breeding habitat to meet habitat quality guidelines (Appendix H).		
Task(s)	**Responsible Group(s)**	**When**
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed
2. Use habitat improvement techniques identified in (Monsen 2005) to improve nesting cover (sagebrush canopy, understory) associated with leks on Piñon Mesa to meet minimum vegetation guidelines (Appendix H) or until nest success averages 50% (see "Habitat Enhancement" rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS	2010
3. Use habitat improvement techniques identified (Monsen 2005) to improve forb component of brood-rearing habitat associated with leks on Piñon Mesa where hens are known to remain to raise young (see "Habitat Enhancement" rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Incorporate recommendations from rangewide strategy on "Grazing" (pg. 211) into grazing management plans on 10,000 acres for existing conservation easements.	CDOW, NGO's Private Landowners	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, County Governments, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Government, Local Work Group, USFS	ASAP
3. Implement recommendations from rangewide strategy on "Oil & Gas Development and Mining" (pg. 233).	BLM, CDOW, Oil and Gas Companies, Private Landowners	ASAP

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, CDOW, Local Work Group, UDWR	As needed
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group	2005-06
3. Investigate opportunities to expand currently occupied habitat into Vacant/Unknown or Potentially Suitable habitats that would also begin to establish linkages between other populations.	BLM, CDOW, Local Work Group, UDWR	2008

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population (see Appendix I).		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group	2005 and ongoing
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, Local Work Group, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220)	BLM, CDOW, UDWR, USFS	Begin in 2006; Complete in 2008

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level (see "Habitat Monitoring" rangewide strategy, pg. 220).	BLM, CDOW, UDWR, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, UDWR, USFS	July, 2006

Poncha Pass

Primary Issues to be Addressed

The threat of extinction of this population is relatively high, because of its small size, and there is limited opportunity for habitat expansion to improve the outlook for the population. In addition, there are some risks to GUSG and their habitat from residential development, recreation, and mining.

Due to the small size of currently available habitat, the associated small sage-grouse population size that can be supported may be subject to local extinctions without intervention. Periodic demographic rescue may be necessary and infusions of genetic material to counter loss of genetic diversity will be required over time. However, depending upon available resources, efforts may need to be weighed against needs of other small populations having much larger acreages of available habitat, and hence, greater probability of being self-sustaining.

Residential development on private land is a threat to GUSG at Poncha Pass (risk of development is discussed in detail in "Habitat – Risk of Permanent Loss", pg. 149). The area is scenic, easily accessed via Highway 285, and some interior parcels of land are in small tracts and currently for sale.

There is some threat from cumulative physical disturbances associated with recreation in the area. In addition, a mica mine was recently proposed near Poncha Pass, and although the application has been withdrawn, the possibility of a mine (and potential negative impacts on GUSG and their habitat) remains.

Strategies to assist the Local Work Group with these issues, as well as others, are provided in this section.

Population Target

Historical information on population size is very limited since lek counts were not conducted prior to the recent transplant (2000). This population was thought to have been established and has persisted since the initial transplants in the early 1970's. It is possible there were 50-75 sage-grouse during this interval. This population size has about a 40-60% extinction probability over a 50-year time period. This population has relatively low potential for serving as a reservoir for demographic or genetic rescue of other populations. We set a long-term (10-year) average target of 75 birds (Table 32, pg. 256), but extraordinary efforts will not be undertaken to achieve it because the functional difference between a population of 30-40 and 75 is not great.

Clearly all populations that fluctuate independently of Gunnison Basin have conservation value and merit protection, but extraordinary attempts to sustain Poncha Pass that divert resources from other, larger populations more likely to persist, are probably not warranted. Nevertheless, available suitable but unused habitat makes translocation a viable option. Habitat quality is generally good, and recent efforts have improved it. About 24% of the currently occupied habitat is privately owned.

Habitat expansion opportunities at Poncha Pass are very limited, although sage-grouse do have opportunities to expand into some apparently suitable, but un-used habitat (Table 39). At this small acreage (15,000) the habitat model (see pg. 186) is not instructive.

Although no habitat protection goal is enumerated, opportunities to permanently protect private habitat that do not directly compete with protection of privately held habitat in other populations (such as BLM land trades or easements) should be explored.

Table 39. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in Poncha Pass area. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied –Selected Classes		**Vacant/Unknown use**		**Potentially Suitable**	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	9,478	64			48	-
Grass or grass/forb	1,777	12			3,225	12
Rabbitbrush/grass mix	2	0			4,932	18
Shrub/grass/forb mix	1,614	11			14,825	53
Piñon -Juniper dominant	398	3			698	3
Riparian shrub, sedge, forb	**77**	<1			2,987	11
Other	1,434	10			1,079	4
Totals	**14,781**	**100**	**-**	**-**	**27,794**	**100**

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154 and Appendix F).

Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss.	BLM, CDOW, County Government, NGO's	Ongoing

HABITAT IMPROVEMENT

Strategy 1: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 2: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, County Governments, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Governments, STL, USFS	ASAP
3. Implement recommendations from rangewide strategy on "Recreational Activity" (pg. 245).	BLM, Local Work Group, USFS	As needed

Strategy 3: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Habitat Monitoring" (pg. 220), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, Local Work Group	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, STL, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	BLM, CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group	As needed
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" strategy (pg. 225), and "Oil & Gas and Mining" strategy (pg. 233).	BLM, CDOW, Local Work Group, STL, USFS, Utility Companies	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation" (pg. 241).	CDOW, Local Work Group	As needed
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level ("Habitat Monitoring" strategy, pg. 220)	BLM, CDOW, USFS	Begin in 2006; Complete in 2008

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level ("Habitat Monitoring" strategy, pg. 220)	BLM, CDOW, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 220).	BLM, CDOW, USFS	July, 2006

San Miguel Basin

Primary Issues to be Addressed

Primary threats to this population are recent dramatic increases in natural gas development, habitat loss to development and subdivision, poor habitat quality, and effects of drought. An additional challenge facing GUSG management in the area is the large amount of privately controlled land. Cooperating with private landowners in the protection and management of GUSG will be key to the long-term success of the GUSG preservation effort.

Oil and gas exploration activities in the San Miguel Basin have increased dramatically in recent months. Exploration and production activities are scheduled to expand in the near future and associated probable affects on sage-grouse are of great concern.

Residential development is a major threat to GUSG in the San Miguel Basin, especially at Iron Springs and Gurley Reservoir. Good progress has been made on fee title acquisition in the Miramonte Reservoir and Dry Creek Basin areas (1,350 and 1,500 acres, respectively), with discussions/negotiations on additional easements (by CDOW, San Miguel Open Space) and land swaps (BLM) ongoing here and in other areas. The local work group is currently (November 2004) working to establish a process to prioritize habitat protection among the subpopulations.

Past or current sagebrush removal has reduced habitat at Dry Creek Basin, Gurley Reservoir, and Beaver Mesa. At Dry Creek Basin remaining sagebrush patches were subjected in the past to overgrazing and continue to succeed to a late-seral sagebrush community dominated by sagebrush, lacking in understory, and not ideal for GUSG use. Habitat loss in the form of piñon-juniper encroachment is also a problem in some areas, particularly in Dry Creek Basin. The southern third of the range at Beaver Mesa is private property managed by working ranches, and past conversion of sagebrush habitat to seasonally irrigated pasturelands has left little sagebrush cover in most of this area.

Following the drought of 2002, approximately 75% of the total sagebrush canopy in Dry Creek Basin was lost to sagebrush defoliation (Wenger et al. 2003). Although most plants survived and exhibited signs of recovery in 2003, there were significant areas, particularly in the low sage, where over 90% of the plants died (Wenger et al. 2003). The decrease in lek attendance in Dry Creek Basin is of great immediate concern and is most likely related to poor habitat conditions exacerbated by the recent drought. Additions to the breeding population in Dry Creek Basin through augmentation should be seriously considered.

Strategies to assist the local work group with these issues, as well as others, are provided in this section.

Population Target

A long-term (10-year) average population target of 450 birds was established (Table 32, pg. 256). Although recent population peaks may have approached this level, maintaining it as a long-term average will be a challenge given the current condition of vegetation and poor site potential of Dry Creek Basin (which comprises about 60% of occupied habitat for the population), and development pressures elsewhere. At stable growth rates, this population size has a 50-year extinction probability of about 5%, without intervention. A

population that averages 450 birds would be expected to fluctuate between 260 and 792. A breeding population with a long-term average of 450 would require about 90,000 acres of average quality habitat (see GUSG linear model, discussion begins pg. 186). This is close to the total acreage now occupied, (85,999 occupied, with an additional 41,524 vacant and 61,783 potentially suitable, Table 40). However, this habitat exists in 6 distinct and separated geographic areas which probably reduces its ability to maintain grouse.

We identified 41,360 acres of presumably suitable habitat in the Basin as vacant or of unknown use (Table 40). Analysis of plant communities in this vacant category suggests this area would be suitable primarily for late summer brood rearing (dominated by mesic mountain shrubs [23%], Gambel oak [18%], rangeland [13%], conifers and/or deciduous trees [17%], and subalpine grass communities [10%]), with less than 7% of the acreage dominated by sagebrush communities. It is likely much of this vacant, unknown use category currently receives summer use by grouse, and unlikely this category has potential to increase populations year round.

Although an additional 62,000 acres was identified as potential habitat, much of this is privately held (63%) and only 34% is currently classified with sagebrush as the dominant vegetation. While about a third of the vegetation is dominated by piñon-juniper, only about 5% has sagebrush or mountain shrubs as an understory to the piñon-juniper. While some gains can no doubt be realized by piñon-juniper removal and other treatments, it is unlikely much of this can be converted to suitable habitat in the future.

Table 40. Vegetation classification of occupied habitat and adjacent areas that are delineated as "vacant/unknown" and "potentially suitable" (see pg. 54 for definitions) in San Miguel Basin. Classification is based on GIS data (Colorado Division of Wildlife 2004b).

	Category					
	Currently Occupied – Selected Classes		**Vacant/Unknown use**		**Potentially Suitable**	
Vegetation Classification	**Acres**	**Percent**	**Acres**	**Percent**	**Acres**	**Percent**
Sagebrush dominant	40,890	48	4,026	10	25,481	41
Grass/forb rangeland	19,136	22	5,435	13	4,548	7
Gambel Oak	7,338	9	7,433	18	6,738	11
Mountain shrub	8,069	9	9,616	23	18	-
Piñon -Juniper dominant	-		410	1	5,640	9
Coniferous/deciduous trees	1,350	1	7,408	18	1,849	3
Agriculture	920	1	91	-	13,069	21
Other	8,296	10	6,941	17	4,440	7
Totals	**85,999**	**100**	**41,360**	**100**	**61,783**	**100**

The SMBCP (1998) listed minimum population goals of 255 sage-grouse by spring of 2002, and an optimum goal of 480 by 2007-2012.

Protecting significant seasonal habitats in private ownership within core areas like Miramonte, Dry Creek, and Hamilton Mesa will be essential to either meet this target or maintain GUSG in this population. Maintaining breeding sub-populations in the Gurley Reservoir and Beaver Mesa - Iron Springs areas will be particularly challenging given that these areas are almost entirely privately held (91, 100, and 92%, respectively) and land prices are high. Collectively these areas have represented 33-41% of the breeding population of the entire San Miguel Basin in recent years, so they are very significant. Areas of immediate and high conservation importance include the area west and south of Gurley Reservoir that is already subdivided into small lots, and currently offered for sale. As discussed earlier, additional habitat protection in Miramonte and Hamilton Mesa will be necessary in time, while protection of Iron Springs Mesa may be beyond our means.

Recommended Conservation Strategies

HABITAT PROTECTION

Strategy 1: Maintain 90% of those vegetation communities likely used by GUSG within occupied habitats (combined public and private), by protecting the necessary proportion of those private lands that are at risk of development from conversion to unsuitable housing densities (see "Spatially Explicit Analysis of Impacts of Additional Housing Units", pg. 154), and Appendix F.		
Task(s)	**Responsible Group(s)**	**When**
1. Select from available options (see "Habitat Protection from Permanent Loss" rangewide strategy, pg. 223) to permanently protect occupied sage-grouse habitats at significant risk of permanent loss in the San Miguel Basin.	BLM, CDOW, County Government, NGO's, USFS	Ongoing and by 2020

HABITAT IMPROVEMENT

Strategy 1: Develop 1,000 acres of additional GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Eliminate piñon /juniper from 1,000 acres within Dry Creek Basin (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	2010

Strategy 2: Improve 560 acres of existing breeding habitat to meet habitat quality guidelines.		
Task(s)	**Responsible Group(s)**	**When**
1. Brush beat or otherwise control sagebrush and other shrubs on lek sites (see "Habitat Enhancement" rangewide strategy, pg. 214 and Monsen 2005).	BLM, CDOW, Local Work Group, NRCS	As needed

Strategy 2: Improve 560 acres of existing breeding habitat to meet habitat quality guidelines.		
Task(s)	**Responsible Group(s)**	**When**
2. Use habitat improvement techniques identified in Monsen (2005) to improve nesting cover (sagebrush canopy, understory) associated with leks within Dry Creek Basin to meet minimum vegetation guidelines or until nest success averages 50% (see "Habitat Enhancement" rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS, USFS	2010
3. Use habitat improvement techniques identified in (Monsen 2005) to improve forb component of brood-rearing habitat associated with leks within the Dry Creek Basin where hens are known to remain to raise young (see "Habitat Enhancement" rangewide strategy, pg. 214).	BLM, CDOW, Local Work Group, NRCS, USFS	2010

Strategy 3: Use grazing to manage for high quality GUSG habitat.		
Task(s)	**Responsible Group(s)**	**When**
1. Develop and implement grazing management plans on 5,000 acres by incorporating sage-grouse habitat objectives into conservation easements.	CDOW, NGO's, NRCS	2010
2. Incorporate grazing management practices (such as those presented on page 212) for both cattle and sheep that are compatible with, or enhance, GUSG habitat (see Appendix H) on federal and state lands during the permit renewal process, or when monitoring indicates need.	BLM, CDOW, NRCS, Private Landowners, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225).	BLM, CDOW, County Government, STL, USFS, Utility Companies	As needed
2. Implement recommendations from rangewide strategy on "Noxious and Invasive Weeds" (pg. 232).	BLM, CDOW, County Government, STL, USFS	ASAP
3. Implement recommendations from rangewide strategy on "Oil & Gas Development and Mining" (pg. 233).	BLM, CDOW, Oil and Gas Companies, Private Landowners, STL, USFS	ASAP

Strategy 4: Minimize GUSG habitat fragmentation and degradation.		
Task(s)	**Responsible Group(s)**	**When**
4. Move road away from Desert Lek.	BLM, County Government, Private Landowner	2007

Strategy 5: Monitor existing and new GUSG habitat for quality.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on Habitat Monitoring" (pg. 214), particularly monitoring of status of recovery of sagebrush die-off areas.	BLM, Local Work Group, USFS	Ongoing
2. Evaluate suitability of vacant/unknown habitat classification and determine if habitat improvement techniques may enhance suitability.	BLM, CDOW, Local Work Group, USFS	2005-06

POPULATION MANAGEMENT

Strategy 1: Monitor population and area to detect changes in GUSG numbers and distribution.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations in the "Population Monitoring and Targets" rangewide strategy (pg. 242).	CDOW, Local Work Group	Annually

Strategy 2: Minimize disturbances to GUSG population.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Lek Viewing" (pg. 231).	BLM, CDOW, Local Work Group, USFS	2005
2. Implement timing restrictions provided in rangewide "Human Infrastructure: Powerlines, Other Utility Corridors, Wind Turbines, Communication Towers, Fences, and Roads" (pg. 225) strategy, and "Oil & Gas and Mining" strategy (pg. 233).	BLM, CDOW, Local Work Group, Oil and Gas Companies, STL, USFS, Utility Companies	ASAP

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Population Augmentation") pg. 241).	CDOW, Local Work Group	As needed

Strategy 3: Augment population and genetic diversity.		
Task(s)	**Responsible Group(s)**	**When**
2. Implement recommendations from rangewide strategy on "Genetics" (pg. 208).	CDOW	As needed

Strategy 4: Manage predators to reduce excessive predation.		
Task(s)	**Responsible Group(s)**	**When**
1. Implement recommendations from rangewide strategy on "Predation" (pg. 243).	CDOW, Local Work Group, Private Landowners, USDA (APHIS)	As needed

Strategy 5: Collect field information to refine and map habitat and GUSG use areas.		
Task(s)	**Responsible Group (s)**	**When**
1. Conduct inventory of vacant/unknown habitat areas using inventory technique developed at a rangewide level ("Habitat Monitoring", pg. 214)	BLM, CDOW, USFS	Begin in 2005; Complete in 2008
2. Search for new or unknown existing leks utilizing survey methodology developed at rangewide level ("Habitat Monitoring", pg. 214)	BLM, CDOW, USFS	Begin in 2006; Repeat every 3-5 years
3. Map GUSG seasonal habitats in a GIS as defined per "Habitat Monitoring" rangewide strategy, Objective 1, Strategy #7 (see pg. 214).	BLM, CDOW, USFS	July, 2006

D. Adaptive Management Process

Adaptive management is considered a flexible, iterative approach to long-term management of biological resources that is directed over time by the results of ongoing monitoring and research activities and other information. This means that objectives, biological management techniques, and the assumptions behind both are regularly evaluated in light of monitoring results and new information on species needs, land use, and a variety of other factors. These evaluations are used to adapt both management objectives and techniques to better achieve overall management goals as defined by measurable biological objectives.

The RCP describes the measures believed at this time to be necessary to conserve GUSG. In addition, monitoring populations and habitats are recommended strategies for each GUSG population ("Local Conservation Targets and Strategies", beginning pg. 255), and follow-up monitoring is advised for all habitat treatments, and in the "Fire and Fuels Management" and "Grazing" rangewide strategies (see pgs. 206 and 211, respectively). However, as the status of the species and its habitats change, the information available on species requirements and management prescriptions increases. A more formal adaptive management process to deal with these changing issues will be needed. This process will assess the effectiveness of the existing conservation strategy and propose additional or alternative conservation measures, as appropriate.

Development of the adaptive management process will be completed in a cooperative and coordinated manner with, and under, the direction of the RSC, and with direct input from the signatories of the RCP and the local work groups. The RSC will facilitate implementation of the adaptive management process by annually evaluating the status of meeting the identified habitat and population goals. The annual evaluation will involve the RSC working with the local work groups to (1) monitor GUSG population trends and ecosystem health; and (2) evaluate the effectiveness of management activities in meeting the habitat and population goals of the RCP and in ameliorating the threats identified in the RCP, or any threats identified in the future.

The adaptive management process will provide an objective, quantitative evaluation of the effectiveness of (1) management actions in attaining strategies and objectives outlined in the RCP; and (2) inventory, monitoring, and research results and interpretation. The adaptive management process should provide scientifically sound data and analysis to assist resource managers in allocating and providing funds and scientific resources when undertaking resource management and conservation actions.

E. Summary

Within the conservation strategy section we have established population targets for 6 of the 7 populations, evaluated their relative extinction probabilities using results from a PVA analysis, and developed conservation strategies that we feel can be used to maintain populations at, or above, the population targets. These population targets and extinction probabilities, as well as the range of population sizes expected over time, are summarized in Table 41. Each population is also assigned a relative level of conservation importance, from a rangewide perspective (Table 41). Not surprisingly, Gunnison Basin is ranked as the very highest in terms of conservation importance, because it is the current core population of the entire species. Crawford, San Miguel Basin, Monticello - Dove Creek, and Piñon Mesa are considered high value for conservation importance, and conservation actions should continue to be directed to these populations as well. These populations provide expansion and connection opportunities for GUSG and may serve to maintain the species, should a catastrophic event occur in Gunnison Basin. Until additional population information can be gathered for the Cerro Summit – Cimarron – Sims Mesa area, conservation strategies are recommended to maintain habitat and reduce disturbance (beginning on pg. 259), but a population target is not identified.

A summary of the relative importance of each topic addressed under "Rangewide Conservation Strategies" (beginning pg. 202) for each population is provided in Table 42. This table, along with the detailed "Local Conservation Targets and Strategies", will enable local work groups and others to evaluate which rangewide strategies should be pursued for each population. Table 42 can help direct resources and efforts through applicable rangewide strategies.

Table 41. Population targets, expected ranges, 50-year extinction probabilities, and conservation importance of GUSG populations.

Population	Target, as Long-term Average[1]	Range Low – High	50-year Extinction Probability[2]	Conservation Importance
Gunnison Basin	3,000	1,730-5,280	< 1%	Very High
Crawford	275	159-484	~ 10%	High
San Miguel Basin	450	260-792	~ 6%	High
Monticello – Dove Creek	500 (300/200)	288-880	~ 7%	High
Piñon Mesa	200	115-352	~ 15%	High
Poncha Pass	75	43-132	~ 42 %	Low
Cerro Summit - Cimarron – Sims Mesa	TBD	N/A	-	Uncertain
Total	**4,500**	**-**	**-**	**-**

[1] Long-term average is 10-year average for GUSG.
[2] Extinction probabilities are for stable population growth over 50 years ($r_s = 0.0$).

Table 42. Relative importance of individual threats and opportunities for each population of GUSG, ranked among and within populations. These issues are identified in "Rangewide Conservation Strategies" (beginning pg. 202), and appear in the table in the same order they occur in that section. Relative ranks are as follows: L = Low, LM = Low-Medium, M = Medium, MH = Medium-High, H = High, VH = Very High

ISSUE OR THREAT	POPULATION						
	Cerro Summit – Cimarron – Sims Mesa	Crawford	Gunnison Basin	Monticello – Dove Creek	Piñon Mesa	Poncha Pass	San Miguel Basin
Risk of Disease and Parasites	LM	LM	LM	M	LM	LM	LM
Risk of Wildfire or Need for Fire and Fuels Management	LM	LM	M	M	LM	LM	MH
Risk of Genetic Problems	MH	M	LM	H	H	LM	L
Need for Grazing Management	MH	M	MH	MH	M	M	MH
Need for Habitat Enhancement / Restoration	MH	MH	MH	VH	LM	LM	MH
Need for Development of Habitat Linkages	H	H	L	VH	VH	LM	H
Need for Habitat Monitoring	H	H	H	H	H	H	H
Need for Habitat Protection from Permanent Loss	MH	MH	H	H	M	L	H
Need for Management of Human Infrastructure	L	L	M	M	L	L	H
Need for Management of Hunting	L	L	L	L	L	L	L
Need for Information and Education	H	H	H	H	H	H	H
Need for Management of Lek Viewing	L	M	MH	M	L	L	L
Risk from Mining / Energy Development	L	L	M	H	L	L	VH
Risk from Noxious and Invasive Weeds	LM	L	M	MH	L	L	LM
Risk from Pesticides	L	L	L	M	L	L	L
Need for Population Monitoring	VH	L	M	L	H	L	M
Need for Predation Management	L	L	L	M	L	L	M
Risk from Recreational Activity	LM	L	M	L	LM	L	LM
Need for Research	H	MH	MH	MH	MH	LM	MH
Need for Translocations	M	M	L	VH	VH	MH	M
Weather / Drought Impacts	M	M	M	H	M	M	VH